

My Wonderful Electronics Project

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1. Introduction

- What is my system (*basic description/functions and intended use*)?
- What is the purpose and the main functions of your system (*what problems does it solve/why is it good at what it does*)?
- Where is it used or can be used? (*industrial, research, recreational etc., with examples of similar existing products, **if any***)
- **Where applicable:** Comparison/overview/evolution of similar systems
- Your report must contain at **least 5 references** - these may include links to academic papers (*you can search for these using [Google Scholar](#) or other knowledge bases like Scopus*), press releases, websites, manufacturers' pages etc.

2. Theoretical Background

This part must contain:

- A **schematic diagram** of your system with clear labels of all parameters and variables/symbols.
- Description of how your **circuit/system operates** (*with clear explanations of functions of main components*)
- A pseudo-code/flowchart(s) of your MCU program(s)/algorithm(s)
- If your system contains mechanisms, please add equations of motion (kinematics) if these are vital to explain your system's operation - for instance, dependencies between inputs (e.g. motor angle(s)) and outputs (*gripper/robot arm angle(s)*)
- Likewise, if yours is a dynamic circuit (*e.g. RLC in AC signals*) - please add electrical equations
- Plots of basic sensor/control signals and waveforms (*sine waves, square waves/clocks, typical sensor data and waveforms, etc.*)

3. Electronics Composition

Please list all items and parts you will be using. For instance,

My system will contain

- *A Nucleo-144 microcontroller unit*
- *Two accelerometers*
- *Two electric DC motors*
- *Four wheels and robot's body*
- *LIDAR sensors*
- *Sonar sensors*
- *Approximately one kilometre of electric wiring*
- *Two custom prototyping boards*

Please add any other relevant details (*sensor specifications such as accuracy, precision, bandwidth, range of measurements, etc. - everything that you find important for your system*).

Final report (during/after manufacturing)

4. Electrical and Electronics Design

This section should include more details on your project, including

- Electric/wiring diagrams (*made using software like [Tinkercad](#)*),
- Necessary and relevant excerpts from components' datasheets (*e.g. with signal/sensor specifications, etc.*),
- Your insights into inter-connectivity and communication between different components (*e.g. which communication protocols are used and why, what typical signal patterns are the components/sensors exchanging and so on*)

and any other relevant technical information.

- If your system has an important mechanical sub-system that you have designed, please include drawings or even better exploded view(s) of your system with clear explanations of all parts of the mechanism, with references to them in the text and with clear mentions of how different part of the mechanism are controlled and/or interfaced with sensors.

5. Experimental Evaluation

This part must contain:

- Photos of assembly/manufacturing steps of the real circuit/system (e.g. *soldering, connecting wires*).
- A photo of a complete, working system.
- Photos/screenshots/plots or other results that would demonstrate your system in action (e.g. *your project doing something in response to changing conditions, graphs of real sensor data/signals, etc.*)

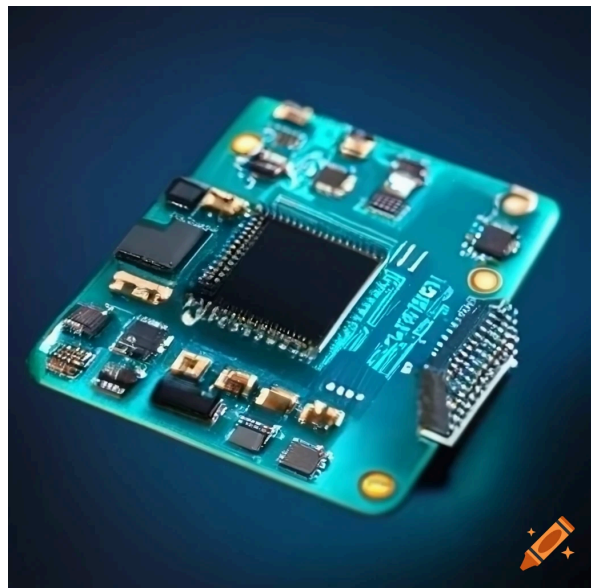


Fig. 1. A photo of my wonderful assembled systems (totally real)

6. Discussion and Conclusion

I guess by now you must know what goes here 😊

Appendix: Program Code

Please include the code you wrote in the appendix section.

References

- [1] L. Birglen and T. Schlicht, "A statistical review of industrial robotic grippers," *Robotics and Computer-Integrated Manufacturing*, vol. 49, pp. 88–97, 2018.
- [2] H. Schunk, R. Steinmann, and A. Wolf, *Grippers in Motion*. Springer, 2005.

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